

Microgravity Fluids for Biology Workshop

ASGSR Workshop III

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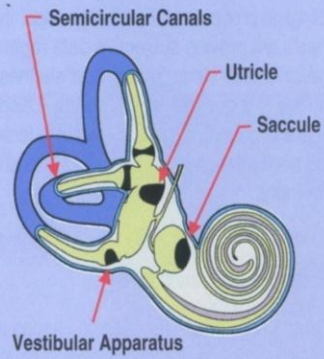


Introduction

- Last year (at first ASGSR meeting) we kicked off/brainstormed ideas to foster collaboration between Fluid Physics and Space Biology.
- Developed a draft White Paper – organized to identify fluids-related knowledge/technical gaps currently facing space biology research.
- Will present overview today and invite the broader community to comment/respond.
- This is not a new concept - our goal is to reenergize both disciplines – challenge them to work together within their current budget/program limitations as well as advocate for new work if warranted.
- Fits into Open Source approach.

Multiscale Fluid-Structural-Interaction Physiological Models

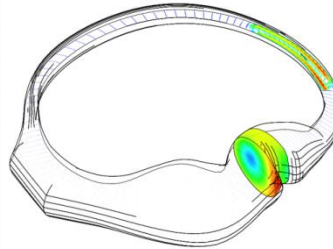
Fluid- Structural Vestibular Model



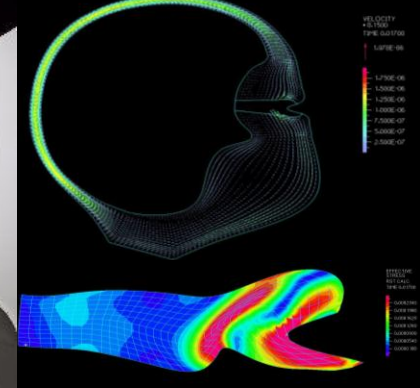
Inner Ear



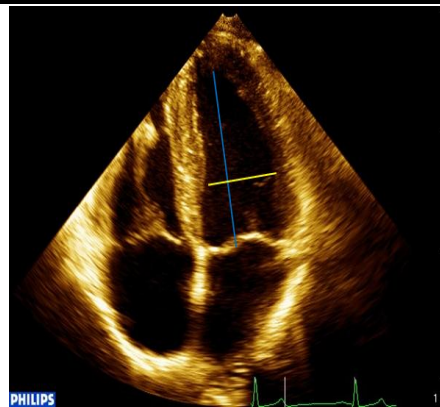
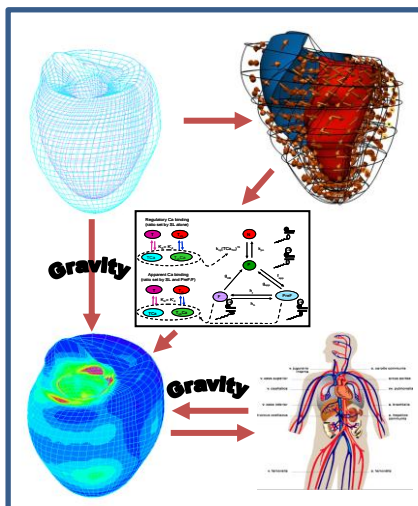
μ G Caloric Stimulation Test



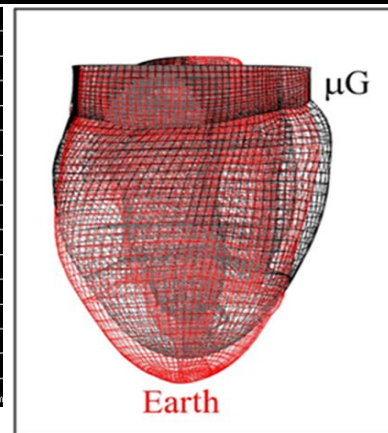
Rotational Chair Test



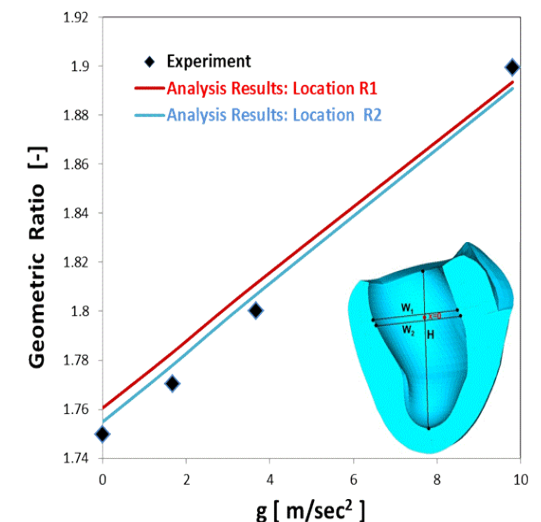
Integrated Multiscale Cardiovascular Model



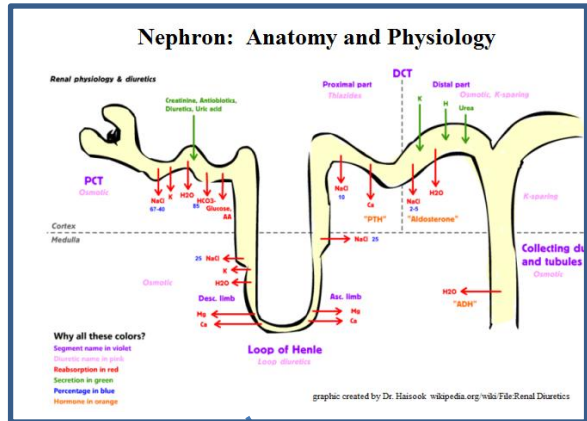
Ultrasound Measurement of μ G Cardiac Shape



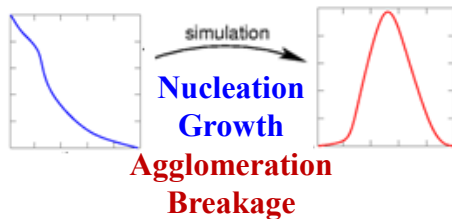
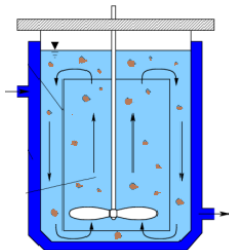
FE Predicted Cardiac Shape Change in μ G



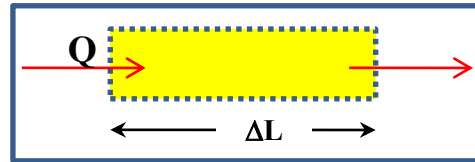
CFD Coupled to Population Balance Model of Nephron as a Continuous Crystallizer



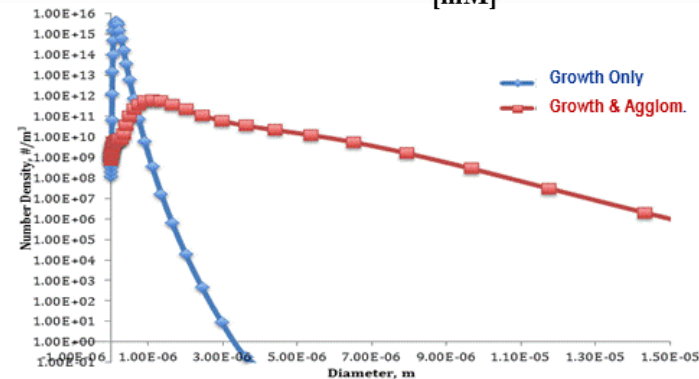
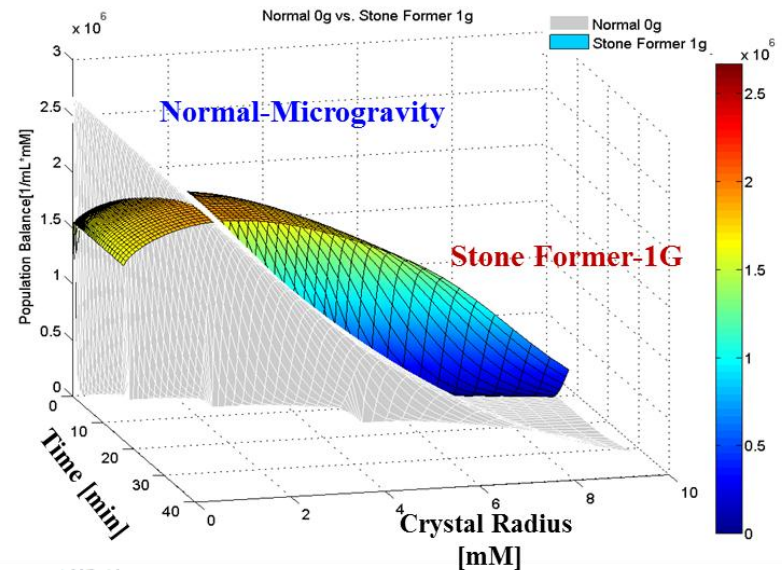
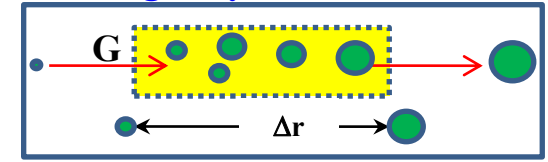
Continuous Crystallizing Reactor



Physical Flow CV (Nephron)



Imaginary Growth CV



Next Steps

- Incorporate comments & suggestions – by November 30th.
- Prioritize risks and finalize white paper – by early next year.
- Identify areas of collaboration and match skills – on going.

Provide to presenters today or email to:

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Please sign and provide email address

Presentations

- *Current and Future Issues for Plant Systems*

Gioia Massa & Charles Quincy, NASA KSC

- *Microgravity Fluids Issues for Animal Systems*

Jeffrey D. Smith, NASA ARC

- *Microgravity Fluids Issues for Cell Biology and Microbiology*

Jeffrey D. Smith, NASA ARC

- *Microgravity Issues for Bioregenerative Life Support Technologies*

Raymond M. Wheeler, NASA KSC